New and Improved!

A *Parasitic* Lindenblad Antenna *for 70cm*

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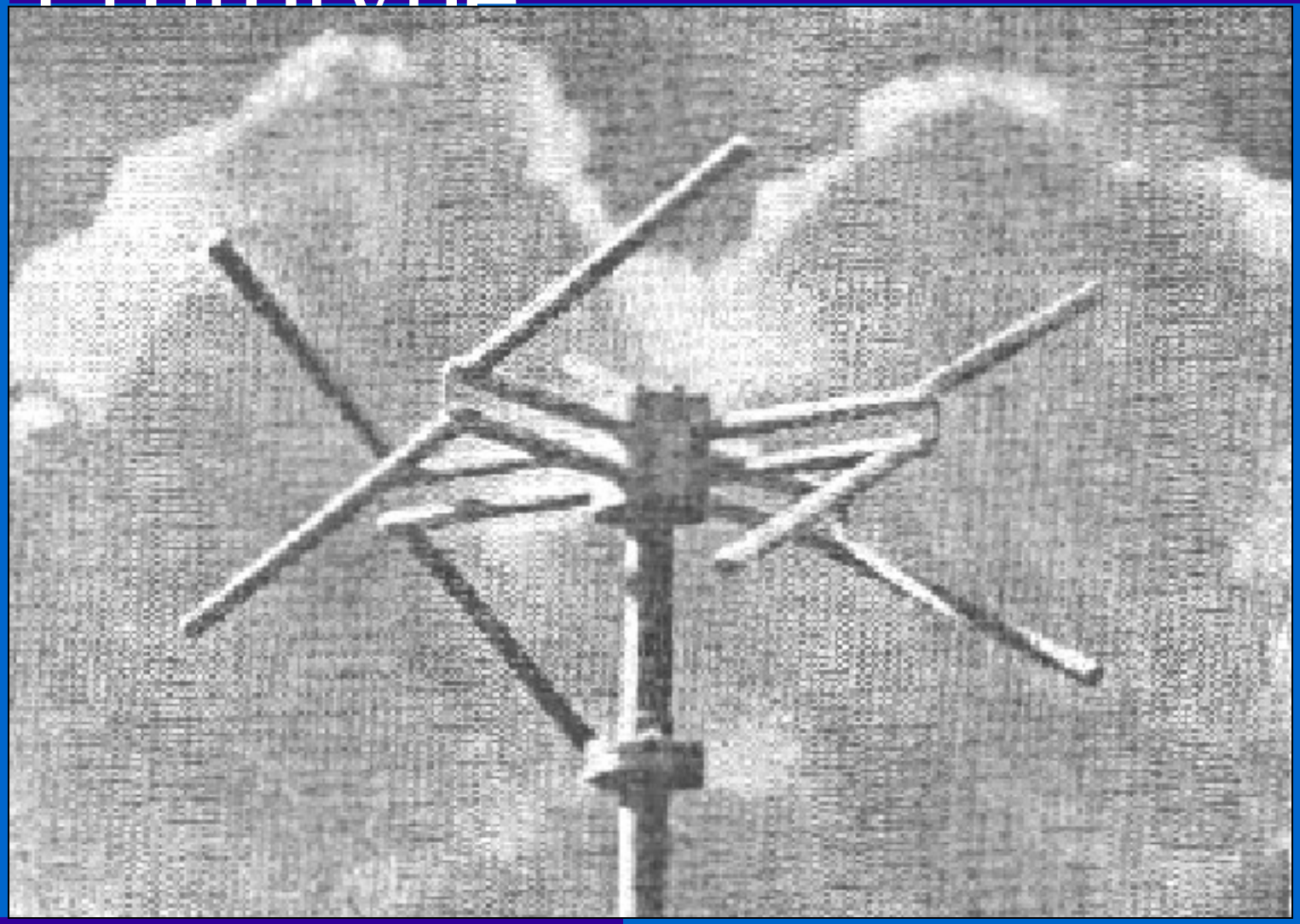
The Lindenblad Antenna

- **Invented by Nils Lindenblad at RCA around 1940**
- **Intended for TV broadcast**
- **Circularly polarized**
- **RCA awarded an “Emmy” in 1984**

The Lindenblad Antenna

- **Circularly polarized**
- **Omni-directional**
- **Maximum gain at low elevation angles (< 30º)**
- **Excellent alternative to a beam antenna for LEO satellites**

Original Lindenblad Prototype



Construction Challenges

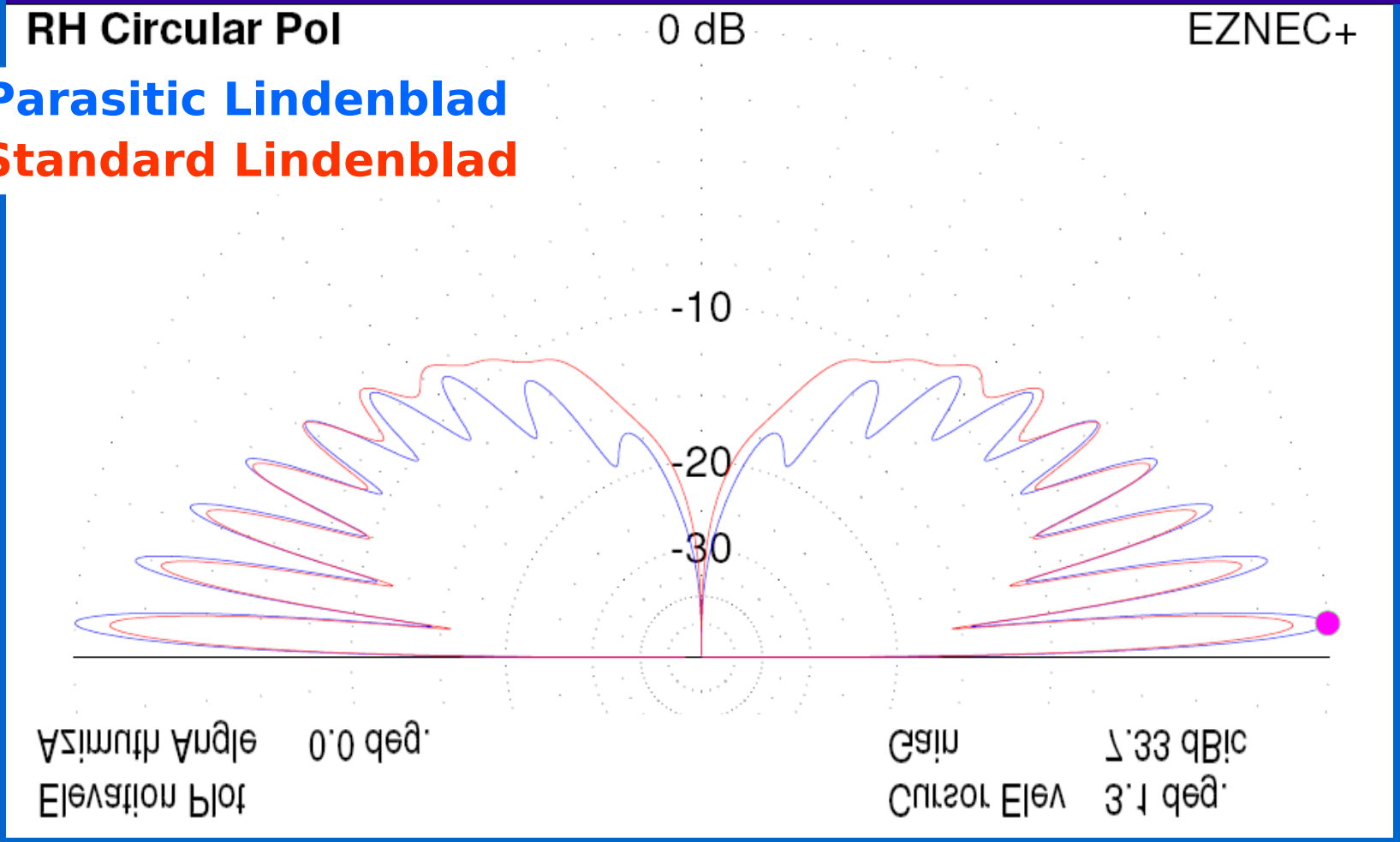
- **Need to feed four 75 Ω dipoles with 50 Ω coaxial cable**
- **Typically requires using BALUN sections, impedance matching sections, folded dipoles, *Twinlead*, balanced lines, transformers etc.**
- **Mechanical complexity**
- **Dimensions are critical on 70cm**

A *Parasitic* Lindenblad Antenna

- **One driven-element (vertical dipole)**
- **Four *parasitic* elements arranged as a Lindenblad**
- **Same radiation pattern**
- **Much easier to build**

A *Parasitic* Lindenblad

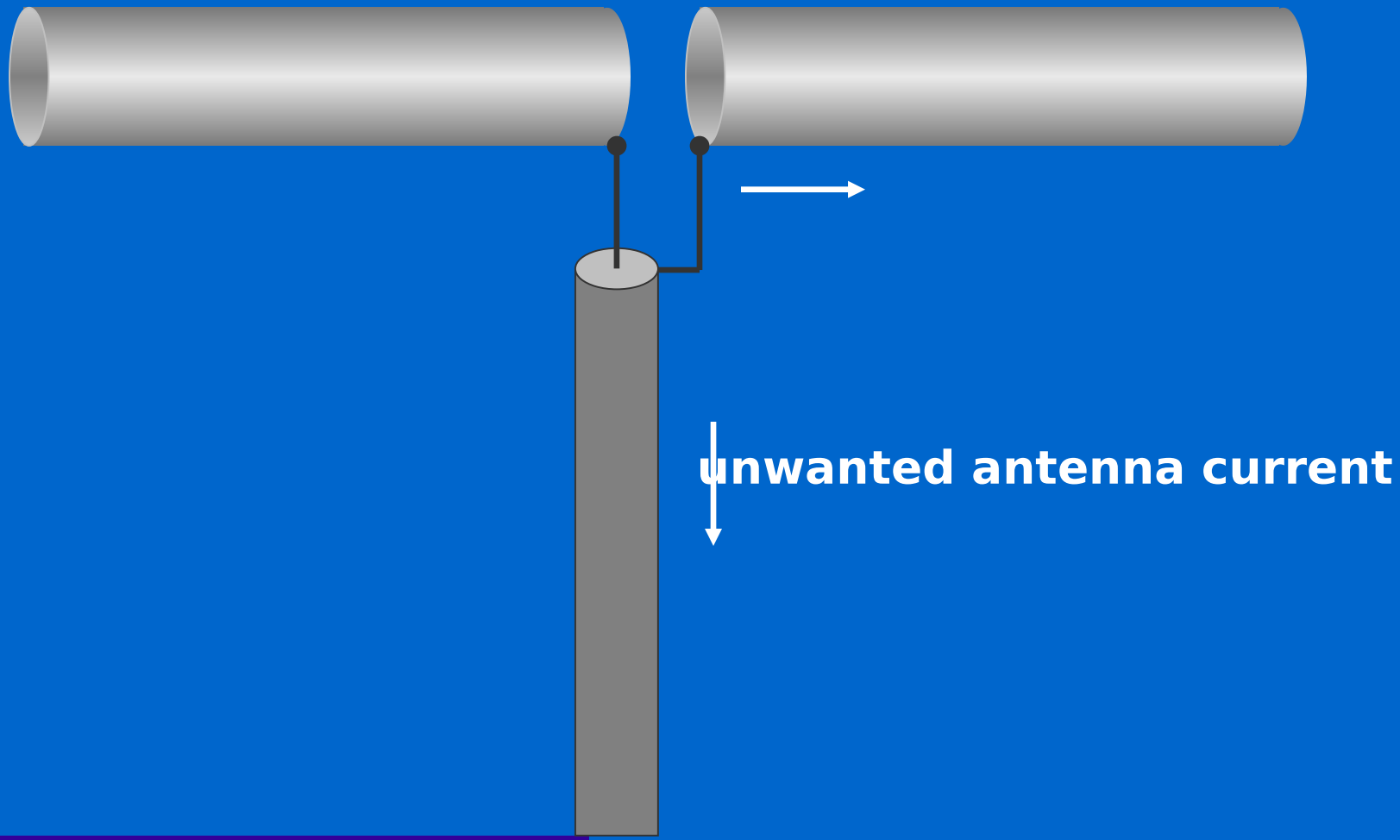
Radiation Pattern



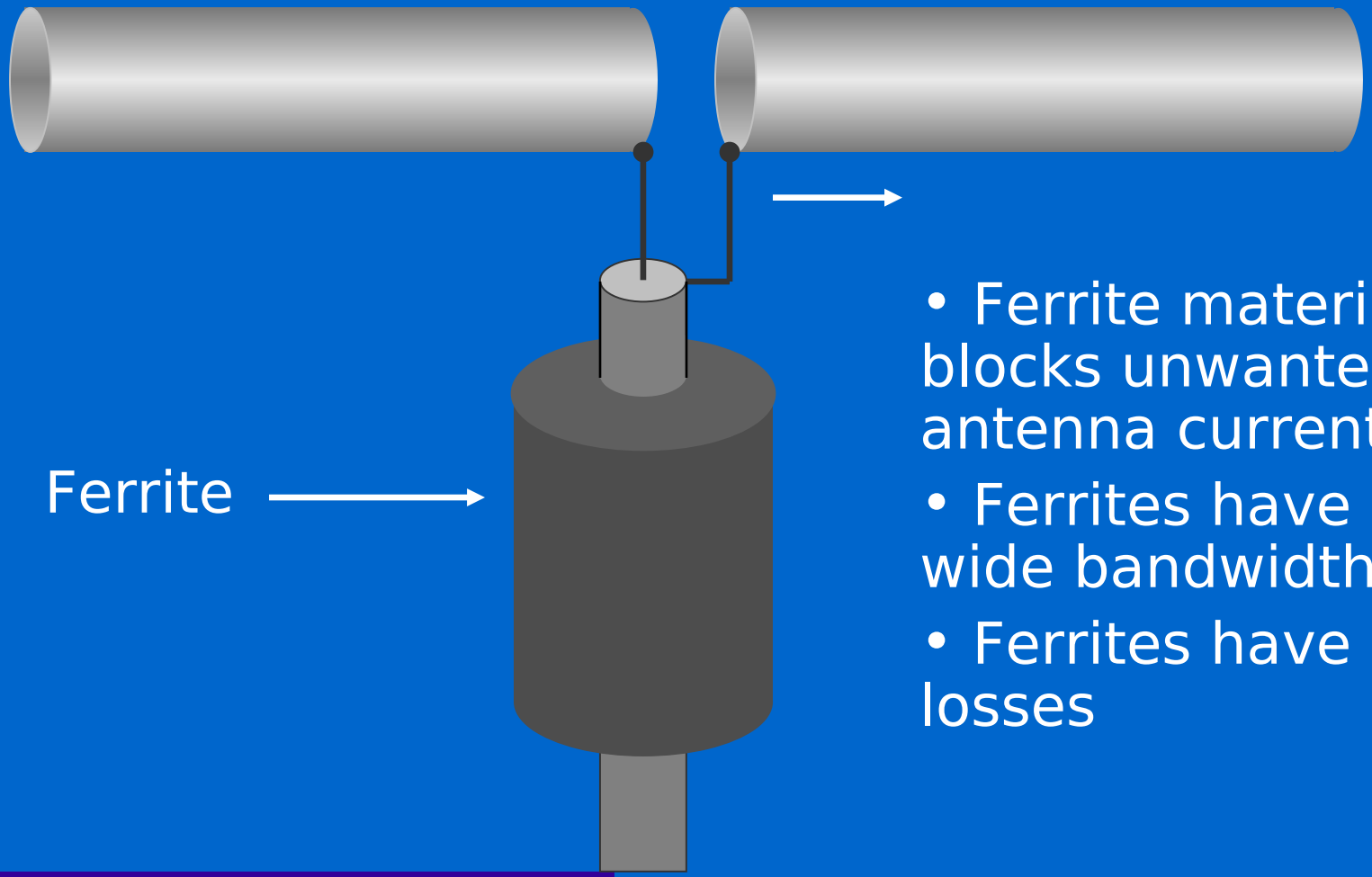
New and Improved

- **Previous version used ferrite BALUN**
- **New version uses sleeve dipole driven element to eliminate need for a BALUN**

Why do we need a BALUN?

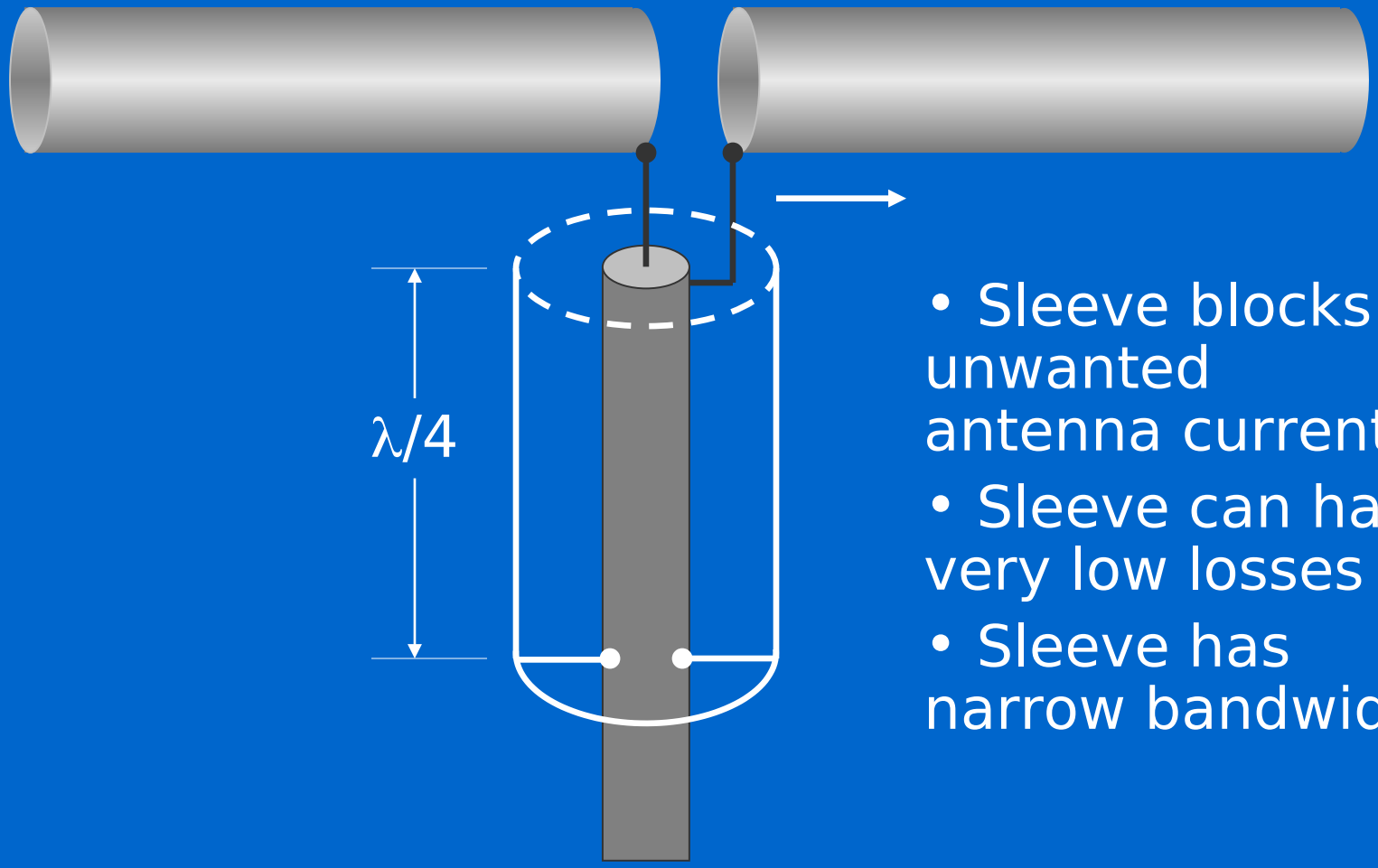


Ferrite BALUN



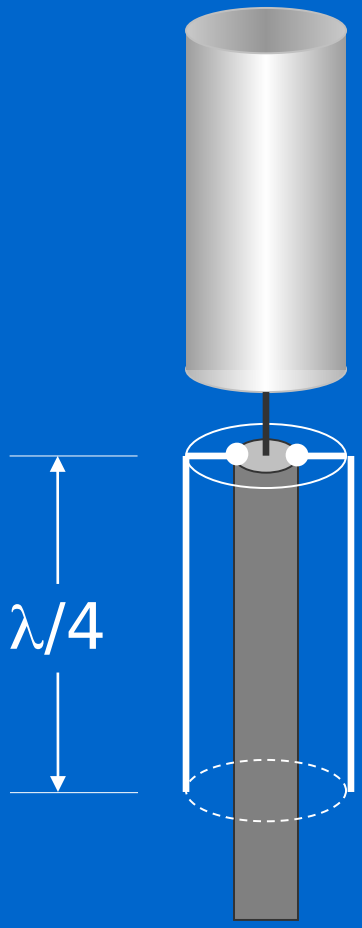
- Ferrite material blocks unwanted antenna current
- Ferrites have wide bandwidth
- Ferrites have losses

Sleeve BALUN



- Sleeve blocks unwanted antenna current
- Sleeve can have very low losses
- Sleeve has narrow bandwidth

Sleeve Dipole



- Lower dipole element functions as a sleeve BALUN

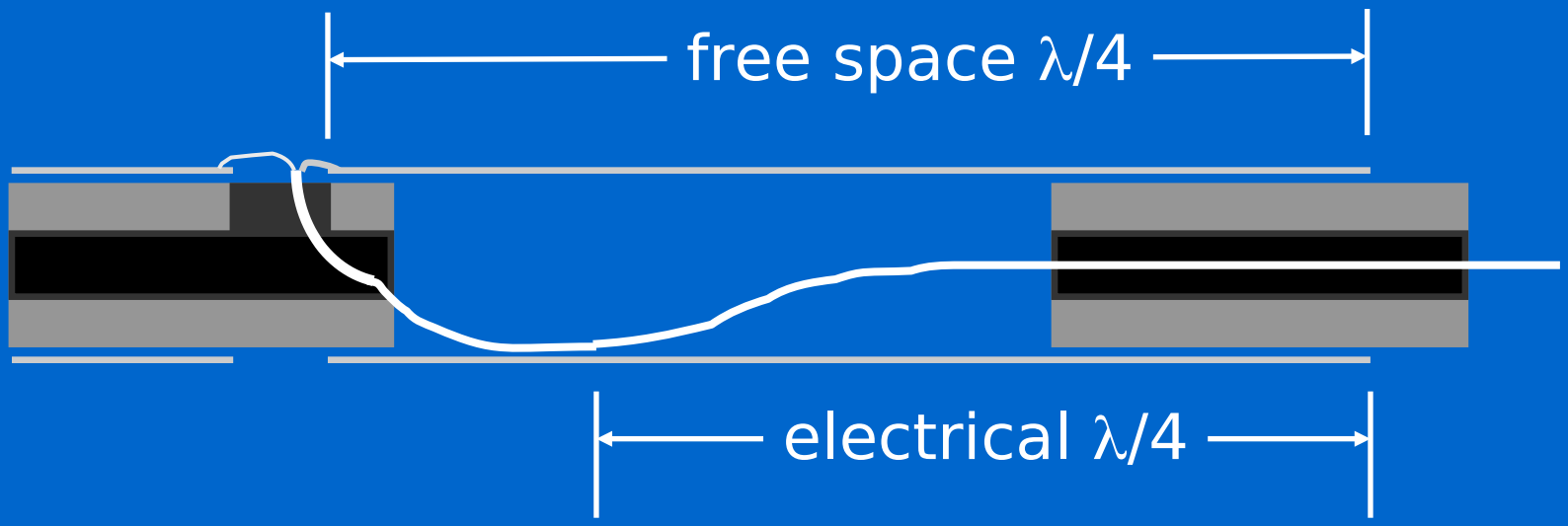
Sleeve Dipole Issues

- **PVC inside sleeve provides mechanical support**
- **PVC has a high dielectric constant which lowers the resonant frequency**
- **Sleeve needs to be much shorter than $\lambda/4$ on the inside**
- **How to make sleeve shorter on the inside than on the outside?**

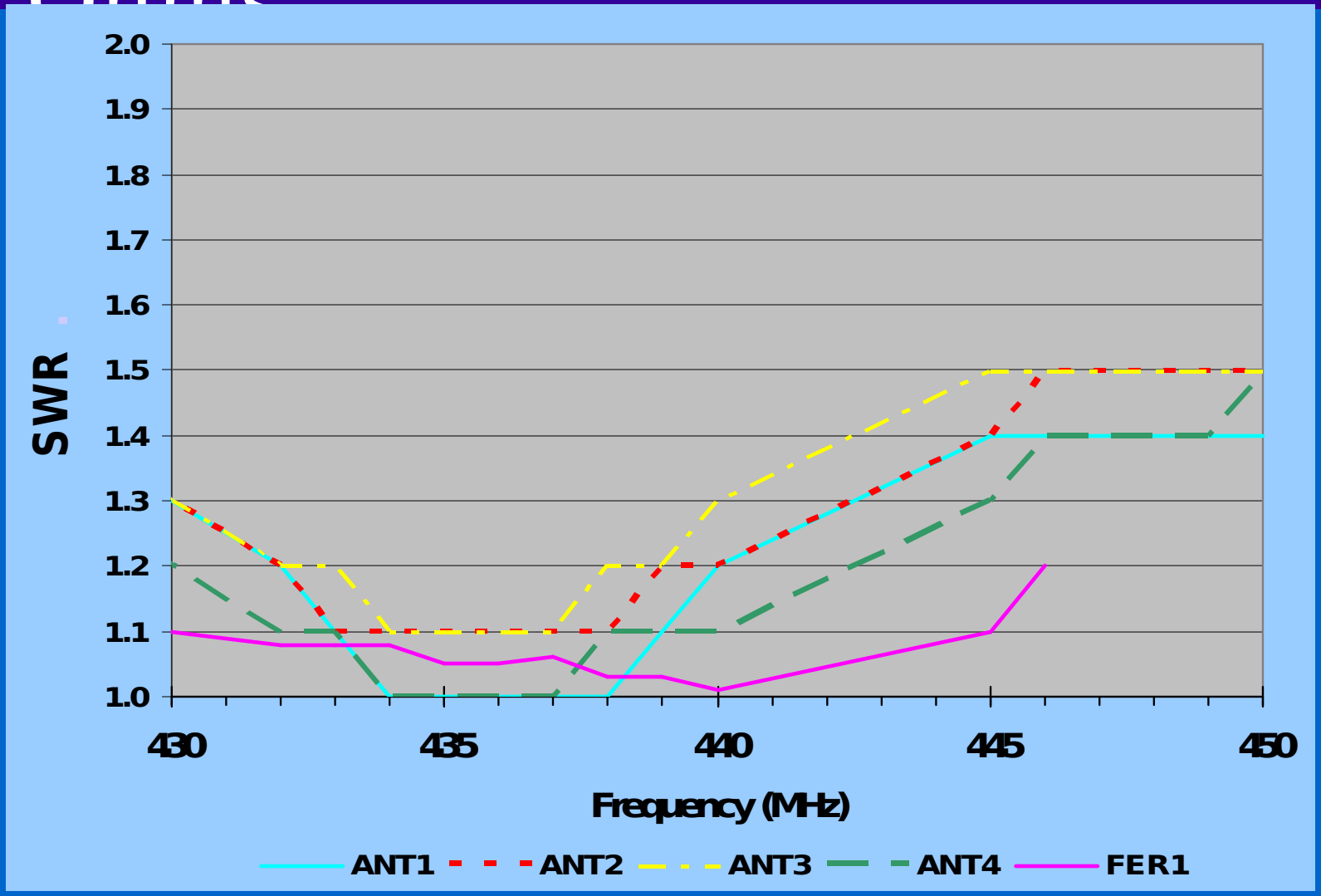
Sleeve Dipole –Simple Solution

- **Use thin coaxial cable in sleeve for wide bandwidth (RG-188)**
- **Do not run coax down the center of the sleeve**

Sleeve Construction



Impedance Match to 50 Ohms



“Antenna Test Range” Results

- **Sleeve dipole version has +1 dB higher gain (lower loss)**
- **Sleeve dipole version easily handles 100 Watts CW key down** *ad-infinitum*
- **Axial ratio ~ 1 dB**

On-the-Air

- **SSB/FM**
- **Uplink on AO-07, VO-52**
- **Downlink on FO-29, SO-50, AO-51**

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Thank You!

Tony - AA2TX